

Effect of foliage trimming and planting time on downy mildew, leaf blight, powdery mildew and canopy micro climate in fenugreek

Y.K. Sharma*, R.K. Solanki and R.D. Meena

ICAR- National Research Centre on Seed Spices, Ajmer- 305206, Rajasthan

Abstract

The effect of foliage trimming once or twice and different time of planting was assessed on downy mildew, *Alternaria* leaf blight and powdery mildew disease PDI, canopy microclimate and seed and foliage yield of fenugreek crop grown during *rabi* season for two years. *Alternaria* leaf blight was not affected by date of sowing. Downy mildew PDI was comparatively more in late sown crop as compared to early and normal sowing. Whereas powdery mildew was more in early sown crop compared to late sown crop. Foliage trimming reduced the downy mildew, blight and powdery mildew PDI but the difference was not significant in blight and powdery mildew PDI. The temperature and RH data from crop canopy showed that trimming treatment reduced the RH % and slightly increased the temperature. The seed yield obtained from normal and early sown crop was higher compared to late sown crop and reduces in single and double trimming as compared to untrimmed treatment. However, the trimming treatments also yielded the green leafy vegetable.

Key words : Date of sowing, downy mildew, fenugreek, foliage trimming, leaf blight.

Introduction

Fenugreek (*Trigonella foenumgraceum* L.) is an important leguminous seed spice crop mainly grown in Rajasthan, Gujarat, Madhya Pradesh, Chhattisgarh, Tamil Nadu and Uttar Pradesh. The crop is cultivated for seed and leaves. The seeds of fenugreek have great medicinal value and rich in oils, alkaloids, vitamins and minerals and they are used in Ayurvedic medicines (Champawat and Singh, 2008, Malhotra and Vashishtha, 2008, Singh *et al.*, 2007). The crop is attacked by several fungi, bacteria, viruses and nematodes causing various diseases resulting in reduced yields. Downy mildew, powdery mildew and *Alternaria* leaf blight are among the most important common foliar diseases of fenugreek (Sharma *et al.*, 2010, Khare *et al.*, 2014). The development and spread of foliar diseases depend greatly on the microclimate of the field. High relative humidity factors influencing the occurrence and spread of the diseases. Foliar trimming results in increase air flow and soil and air temperature and decreased humidity helps to create environment unsuitable for infection and disease development. Similarly foliar diseases can be avoided by adjusting planting time. Keeping in view of the above points the experiment was undertaken to find out the effect of planting time and foliar trimming on the severity of different diseases of fenugreek.

Materials and methods

Experiments were conducted at the ICAR-National Research Centre on Seed Spices, Ajmer, Rajasthan, India. The fenugreek was planted in three different dates of sowing using test variety AFg-3 in line sowing with 10 cm plant and 30 cm row spacing. A randomized block design with three replications per treatment was used in plot size of 3m × 3m. The treatments taken were three different dates of planting (3rd week of October, 1st week of November and 3rd week of November) and trimming (untrimmed, trimmed once 45 days after sowing (DAS) and trimmed twice 45 DAS and 60 DAS). The vertical trimming of the fenugreek was performed by hand keeping of the foliage touching the base of the bed. Downy mildew was assessed in the month of December-January and *Alternaria* leaf blight and powdery mildew was assessed late in the month of February on the appearance of diseases at different time intervals. All recommended package of practices were followed to raise the crop. Foliage yield was recorded after each trimming and seed yield was observed after harvest. Air temperature and relative humidity measurements were recorded after trimming treatments in all treatments from 10 cm above soil level in the fenugreek canopy using portable hygrometer and digital thermometer in the morning and afternoon. Data were analysed statistically.

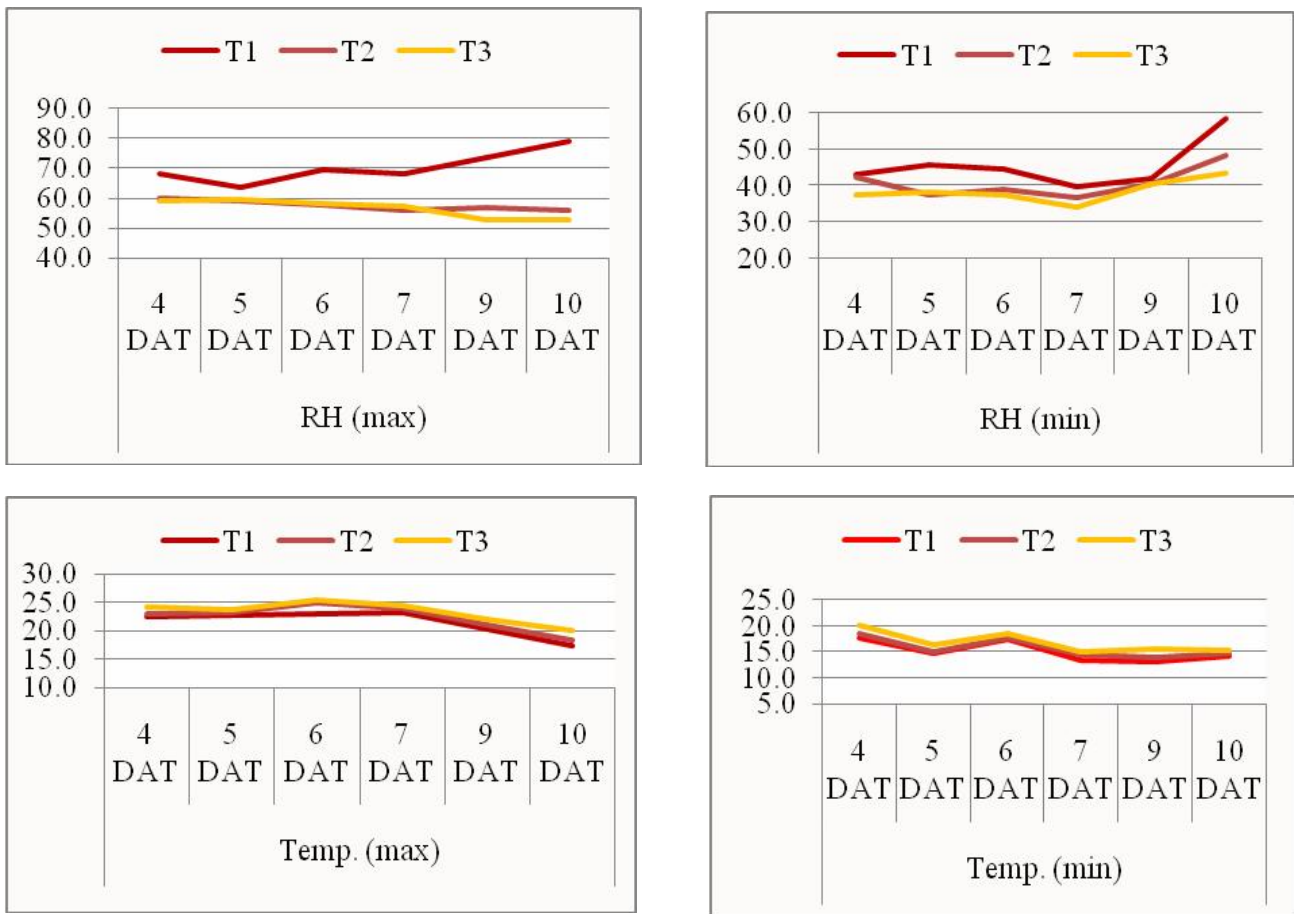
Results and discussion

Air temperature and relative humidity measurements 10 days following trimming treatment revealed that foliage trimming reduced the mean daily relative humidity (RH) in the fenugreek canopy compared with untrimmed treatment. Daily maximum air temperature in the fenugreek canopy were higher in the trimmed treatments than in the untrimmed control from the first foliar trimming treatment (Fig. 1). Mean daily minimum temperature were not affected by foliar trimming.

Planting time and foliage trimming affected the disease PDI and seed yield of fenugreek. Downy mildew PDI was comparatively more in late sown crop (3rd week of November) as compared to early (3rd week of October) and normal sowing (1st week of November). The lowest PDI of downy mildew was recorded from the early sown plots and the highest downy mildew PDI was recorded from late sown crop. The early sowing has lower PDI compared to late sowing and increased with delayed sowing. Similar trend was observed for leaf blight disease, but the difference was non-significant (disease PDI was

observed 39 to 40.2 in different dates of sowing). In case of powdery mildew maximum disease was observed in the early sown crop and less in the late sown crop. The trimming reduced the leaf blight, downy mildew and powdery mildew PDI compared with untrimmed treatments, but there were no significant differences between the single and double trimmed treatments (Fig. 2). Downy mildew PDI was affected with the trimming treatment, the PDI was reduced in double trim and single trim as compared to no trim.

Seed yield of fenugreek was influenced by sowing dates. The seed yield obtained from 1st week November sowing and 3rd week of October was higher compared to late sown crop. The lowest seed yield was obtained from 3rd week of November sowing (Table 1). The seed yield was reduces in single and double trimming as compared to untrimmed treatment. The reduction in seed yield was more in double trimming than single trimming. However, the trimming treatments also yielded the green leafy vegetable. The reduction in seed yield can be compensated with the green foliage yield. The green foliage yield was maximum in double trimming followed by single trimming treatment.



T1=No trim; T2=Trimmed once; T3=Trimmed twice; DAT=Days after trimming)

Fig. 1. Effect of foliage trimming on RH and temperature of crop canopy

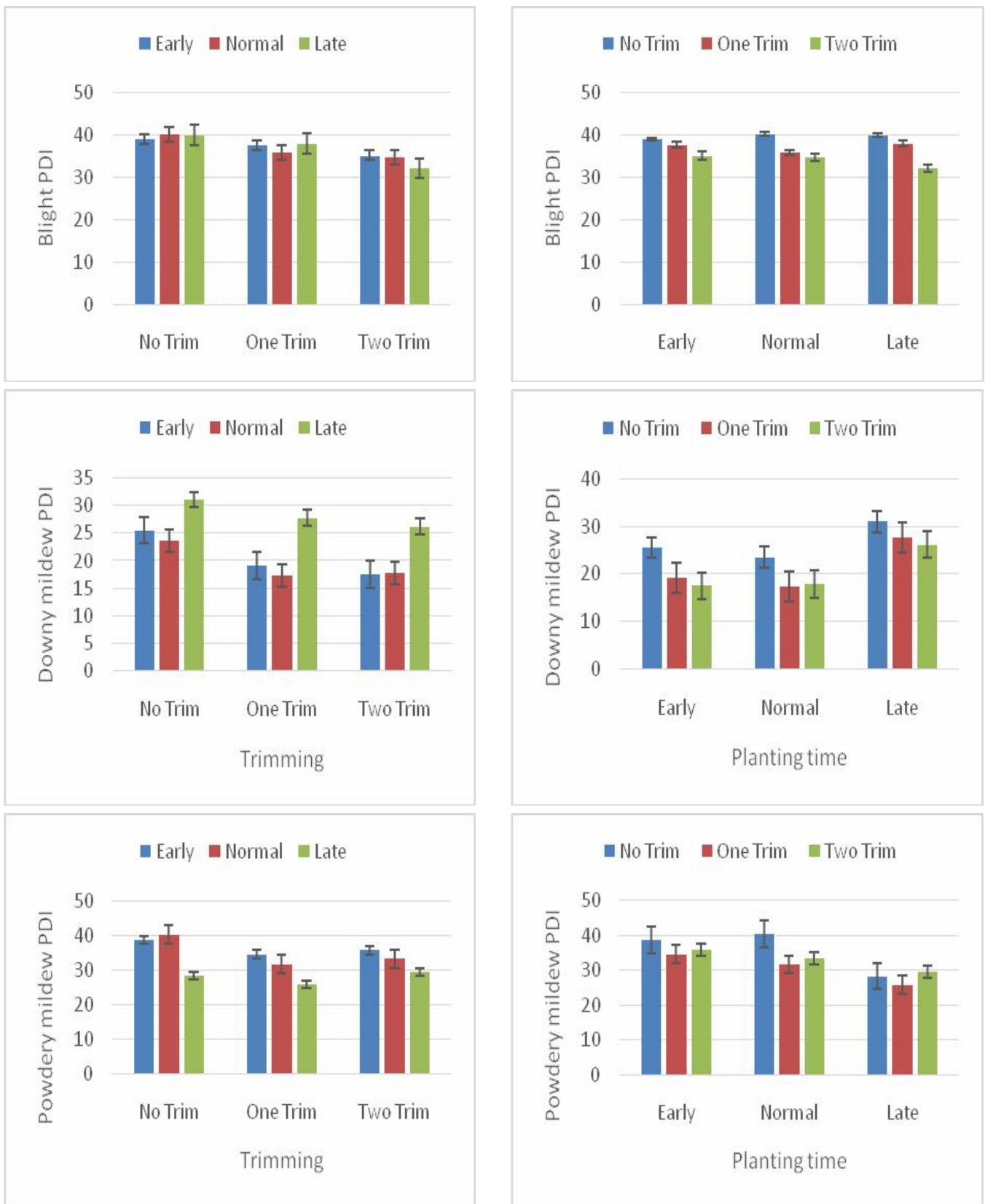


Fig. 2. Effect of sowing time and trimming on leaf blight, downy mildew and powdery mildew of fenugreek

Table 1. Effect of sowing time and trimming on seed and foliage yield of fenugreek

Treatment		Seed Yield (Kg/ha)	Green foliage yield (Kg/ha)
Date of sowing	Trimming		
3 rd wk. Oct.	No Trim	1221	-
	One Trim	1084	196
	Two Trim	774	814
1 st wk. Nov.	No Trim	1317	-
	One Trim	1185	358
	Two Trim	889	1079
3 rd wk. Nov.	No Trim	1124	-
	One Trim	753	260
	Two Trim	631	875
CD (P=0.05)		346.3	138.5

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